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Fig juice Fortified with Inulin and Lactobacillus Delbrueckii: A Promising Functional Food

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Abstract

Background and Objective: Nowadays, consumption of functional foods is favored because of their health promoting characteristics. Also there is an increasing demand for nondairy products because of lactose intolerance in dairies. Fig juice as a source of dietary fiber and other nutrients would be a functional food. Adding probiotics and prebiotics makes it more functional for daily use. No study has yet been done on synbiotic fig juice. Accordingly, the aim of this study was to characterize synbiotic fig juice prepared by *Lactobacillus delbrueckii* and inulin.

Material and Methods: Samples consisted of control fig juice; fig juice fermented by *Lactobacillus delbrueckii* (probiotic) and fig juice containing inulin fermented by *Lactobacillus delbrueckii* (synbiotic) were produced. Physico-chemical parameters, total phenolic content, antioxidant capacity and microbial survival aspects were analyzed during the fermentation period. Aforementioned parameters were also evaluated in 4 weeks with one week time intervals. Sensory characteristics of fig juices were assessed in the second week of storage.

Results and Conclusion: The results showed significant differences among treatments ($p \leq 0.05$) in physico-chemical indices during incubation and storage time. Total phenolic content and antioxidant capacity of fermented fig juices were significantly increased in comparison to the control samples ($p \leq 0.05$). Viability of *Lactobacillus delbrueckii* was increased in both probiotic and synbiotic treatments during incubation; but a significant reduction was observed during storage time. Sensory analysis revealed that there were significant differences in terms of odor, taste and overall acceptance between the fermented fig juices and control ($p \leq 0.05$) and the highest scores were obtained for control. Considering viable counts of *Lactobacillus delbrueckii* depicted that fermented fig juice could be a suitable medium for survival and proliferation of *Lactobacillus delbrueckii* in adequate amount for health promotion. So this research showed that fig juice can be a potential product for manufacture of a new functional food.

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1. Introduction

Nowadays the global market for functional food products have experienced rapid growth. In the recent years, there has been an increasing interest in consumption of fruit juices in order to provide a healthy diet, supplemented with minerals, vitamins, antioxidants, which is also contributes to their unique taste. In this sense, technologists have been focused on the manufacture of new products enriched with bioactive compounds with acceptable sensory characteristics [1,2].

Due to several medicinal properties, fig juice is introduced as a healthy drink. Fig *(Ficus carica)* is used therapeutically as food supplements, because it improves body immunity and other health attributes. A clinical study showed that fig fruit supplementation improved symptoms in patients suffering from functional constipation. Supplementation with fig fruit increased the number of bowel movements, reduced defecation time, and improved the abdominal pain [3]. Fig juice is known as an excellent